



[The Digital Future](#)

More than Just Bitcoin

The Potential of Blockchain Technology,
Using the Example of Latin America

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Today, blockchain technology (BT) has already claimed a prominent position in the sphere of digitalisation. It is becoming increasingly clear that it has countless potential applications, that extend far beyond the Bitcoin digital currency. Eventually, it might even be a safe alternative to weak state institutions, particularly in emerging and developing countries.

Only recently, the US iced tea manufacturer Long Island Iced Tea Corp. renamed itself Long Blockchain Corp. The value of the company's shares subsequently rose by 200 per cent. What has become clear, is that blockchain technology (BT) is predicted to have a great future, at least from an investor's point of view. While the US company offers its iced tea in a specific number of flavours, the potential uses of BT are only very slowly starting to emerge. But one thing is already clear today: The well-known Bitcoins are only the tip of the blockchain iceberg.

A blockchain can basically be understood as an expanding database that is updated and stored on many computers at the same time. The database works like a public cash book that chronologically records all the transactions of the parties involved. The database is updated by combining all the transactions carried out during a certain period into blocks. These blocks are then chained together, using cryptographic methods, to ensure that each new block is linked to all previous blocks in such a way that it cannot be modified. The Blockchain is then complete. Confidence in this data technology and software arises from the fact that the transactions are transparent, i.e. verifiable, and can be viewed by the parties concerned, as well as being permanently monitored on a decentralised basis by the blockchain network. BT is therefore considered to be secure – and, of course, also due to the high level of encryption required. Data stored in a blockchain cannot be deleted. Users can carry out transactions directly with other users without using intermediaries, and these transactions may be anything that can be represented digitally, such as money, contracts, pictures or

music. Blockchain users can remain anonymous by using pseudonyms. What is really special about blockchains, however, is that an intermediary is no longer required if two or more people want to make a transaction. Blockchain technology cuts out the central actors such as banks, which would otherwise have to be trusted to make money transfers. The Economist put it very succinctly in a special edition dedicated to BT entitled “The Trust Machine”.

For policymakers, BT adds an entirely new dimension to digitalisation. While developments such as artificial intelligence, industry 4.0 and the “Internet of Things” already represent a considerable challenge for political decision-makers and the economy, BT actually calls state sovereignty itself into question. Because of its decentralised nature, blockchains promise security and transparency without any superordinate authority. This is an attractive approach, especially for people in countries where faith in state institutions has been shattered. This is true in many Latin American countries, where persistent corruption, banking crises and political instabilities have served to paralyse development. BT addresses this issue by offering itself as a safe alternative to weak state institutions, so there are numerous potential governance applications for the technology. With the exception of the well-known Bitcoins and other digital currencies, blockchain technology has so far mainly been tried and tested within the start-up scene. However, large multilateral institutions such as the United Nations (UN), the global banking market – including central banks – and numerous governments, have all been taking an interest in the technology both in a positive and negative sense, for some time now.

Will Bitcoin Kill Off Central Banks?

At present, the best-known BT application is Bitcoin. Bitcoins are “mined” by creating new blocks within a blockchain as described above. This process takes place in the form of a competition, with rewards going to those in the network who are the first to create a new block. Special computers in the Bitcoin network check whether the new block is correct, i.e. whether it complies with all cryptographic standards. Currently, each new block is worth 12.5 bitcoins. Bitcoins are tradable for anyone who has a corresponding internet account. As time goes by, it becomes increasingly difficult to create new blocks due to the underlying cryptographic process. As a result, more and more computing time is required for each new block. Environmentalists are critical of this aspect because of the associated increase in power consumption, and Bitcoin’s effect on climate change has become a hot topic of debate (“climate killer: Bitcoin”). The main problem is the carbon-intensive coal-fired power plants that are used to generate electricity specifically in those countries where many bitcoins are being mined at the same time. Newer approaches attempt to resolve this issue by generating electricity from renewable energies or using more energy-efficient computers. Newer blockchain technologies have also become available that offer alternatives to the energy-intensive mining process.

State sovereignty is called into question by blockchain technology.

The key difference between Bitcoin and traditional currencies such as the US dollar or the euro, is that Bitcoin does not need a central bank. Users can transfer bitcoins between themselves in a decentralised way using BT. Bitcoins can also be used as a direct payment method in many places, such as cafés and restaurants. It is also possible to convert it to other currencies such as the euro or US dollar. The exchange rate

for 12.5 bitcoins (i.e. the creation of a block) into euros is approximately 101,911.50 euros (as at 7 February 2018).¹ This is a highly attractive exchange rate and one of the reasons why numerous Bitcoin mining farms have started to emerge. By far the most bitcoins are now produced in China. This is an interesting development, considering that China has just banned trade in bitcoins. This also serves to prove just how difficult it can be to regulate the transfer of bitcoins. The only way to control it effectively would be to take control of the entire internet. Bitcoins are also being mined in Latin America, especially in Venezuela, where the huge amounts of energy required for the computing process come very cheap, and this in spite of fierce government opposition.

In Latin America, Bitcoin has long since outgrown the start-up scene and now represents a real alternative to established banking processes. Therefore, it comes as no surprise that many commercial and private banks in countries such as Argentina, Brazil, Mexico and Chile are now trying to develop their own platforms for digital currencies. In addition to Bitcoin, there are also numerous other digital currencies, including Ether and Ripple. However, Bitcoin continues to dominate the market and you can even use Bitcoin ATM machines.

Financial and banking crises have been an important, perhaps even key trigger for the use of Bitcoin in Latin America. This has been most evident in Argentina. The misguided monetary policy of the Kirchner government up until 2015, which essentially led to the devaluation of Argentinian savings and uncoupling from the global financial market, led Argentines to look for alternatives. And Bitcoin provides such an alternative: no state-controlled central bank and no falsified public statistics, but instead

Miner: Mining has established itself as a term for the resource-intensive process of creating Bitcoins – today primarily taking place in big server farms.
Source: © Daniel Becerril, Reuters.

the possibility of making cross-border payment transfers worldwide via the internet. A smartphone or computer with internet access is all that is required. Trade in bitcoins increased steadily until the election of Macris in 2015, and then slowly declined again with the opening up of the Argentinean financial sector.

For Venezuela, there is no democratic, Argentina-style happy ending on the horizon. The devaluation of the Venezuelan bolivar continues apace. What's more, the state-owned oil company PDSV, which is making a growing contribution to the state budget, has become increasingly inefficient and unprofitable due to years of mismanagement, so Venezuela is finding it increasingly difficult to stay solvent. Venezuela

has also been unable to service its bond debts; at the last debt summit, chocolate was on offer instead.² Venezuela's President Maduro has replaced the newly elected parliament with a conformist National Chamber, while opposition parties have recently been banned from taking part in the 2018 presidential elections. It is therefore hardly surprising that more and more Venezuelans are transferring their savings abroad. Restrictive laws have been passed in an attempt to stop this from happening. However, the Venezuelan government's options are very limited if private assets are being transferred using bitcoins. Prior to this particular development, Venezuela also announced that it would create its own internet currency similar to Bitcoin, the "Petro". The Petro is to be secured by



Venezuelan oil, gas, gold and diamonds. Venezuelan President Maduro also announced that he intended to propose this cryptocurrency approach to OPEC.³ The aim of this move is pre-Venezuela could intend to avoid international financial sanctions. To what extent this might actually work is open to question. Ultimately, the attractiveness of Bitcoin lies in the fact that no central authority has control over it, whereas this would be the case with the Venezuelan government and the Petro.

The examples of Argentina and Venezuela show that many people view digital currencies based on blockchain technology such as Bitcoin as established alternatives, especially though not solely when their country's institutions are failing. The state loses fiscal sovereignty when people use digital currencies, which can be a good thing if governments are abusing fiscal policy to the detriment of their citizens and if they are using devaluations of their own currency to hold on to power. Against this background, Bolivia and Ecuador have officially banned Bitcoin, albeit with little success. But this can also be very negative if a government needs to change its financial framework in order to cope with global crises, but then lacks the instruments to do so. Many central banks are already looking into the issue of digital currencies and are considering to what extent they should rely on blockchain technology themselves. Tunisia and Senegal have converted their central banks to blockchains. Blockchains were also a hot topic in the discussions on the banking sector held at the recent economic forum in Davos. The issue of cryptocurrencies is to be addressed within the framework of Argentina's upcoming G20 presidency at the request of European governments such as France and Germany. At present, there is a very heterogeneous approach to regulating digital currencies around the world, with everything from full financial market integration to ongoing analyses, pilot projects and total bans. On the whole, however, it is clear that there is a move towards more regulation. Yet, there is also a worrying trend towards digital currencies being increasingly used by authoritarian regimes to circumvent capital market

controls and financial sanctions. In addition to Venezuela, Belarus has also announced the introduction of its own cryptocurrency.⁴ And we have known for some time that North Korea has been dealing in bitcoins. And now Russia is also showing an interest in developing its own "cryptoruble" mainly as a way of avoiding capital market sanctions imposed by the US government.⁵

It is worrying that authoritarian regimes are using digital currencies in an increasingly active way.

As far as central banks are concerned, digital currencies do not necessarily have to be perceived as competition. Digital currencies could perform an important stabilising function during times of crisis. When a state is hit by a financial or other political crisis, citizens have the opportunity to relocate their assets at a stateless level in order to avoid inflation and market barriers, while still being able to invest in their own country at the same time. For central banks, the existence of such alternatives may have a disciplinary effect. Necessary reforms would have to be carried out more quickly, as central banks could hardly be used for political abuse.

From a development policy perspective, the crucial question is to what extent a stateless currency can contribute to improving people's lives. Blockchain technology addresses one of the biggest development policy obstacles in Latin America: the informal sector. Many people are not officially registered and therefore have no access to financial services.⁶ The independence of digital currencies from states inevitably means that regional restrictions within banking sectors, such as access to international financial markets or international money transfers, can easily be overcome. Exchange into foreign currencies is also possible without any national restrictions. Microloans are easier to provide in instances where there is little banking

infrastructure. For businesses, it would also be considerably easier to invest in and operate international branches in regions with high capital market hurdles or inflation risks. It is therefore conceivable that digital currencies could reduce the financial risks associated with investing in developing and emerging countries. Small companies and start-ups in Latin America in particular could benefit enormously from this.

The price volatility of Bitcoin and its effects on the financial system as a whole, are of particular importance to the current discussion. Many individuals from the financial and banking worlds have repeatedly warned that Bitcoin is a bubble and that collapse is only a matter of time. Already back in 2013, the economist and Nobel prize-winner Paul Krugmann wrote an article in *The New York Times* under the heading *Bitcoin is Evil*.⁷ Recently, even Agustín Carstens, the General Manager of the Bank for International Settlements (BIS, the “central bank of central banks”), joined in the debate with the statement: “What was originally conceived as

an alternative payment system without state participation, has become a mixture of financial bubble, pyramid scheme and environmental catastrophe”.⁸ The danger of a bubble is certainly real, but it is not really relevant in terms of the basic stabilising role that Bitcoin could play for the assets of people in fragile states. The volatility of the currency merely proves that digital currencies, just like other types of currency, are subject to classic financial and economic forces, including speculation. In this respect, investors in this currency are also free to exchange them. In view of the recent falls in the value of Bitcoin (see fig. 1), some capital market companies have also started to remove Bitcoin from their portfolios and to refrain from participating in any further speculation. Facebook has even banned advertising for digital currencies on its network. There is a kind of private-sector self-regulation going on, which makes state intervention, as many central bankers have demanded, seem unnecessary. Added to that is the fact that digital currencies’ share of the global financial market is pretty marginal compared to other currencies

Table 1: Bitcoin Regulation in Latin America

Country	Status
Argentina	no statutory regulation – classified as private property
Bolivia	illegal
Brazil	legal – classified as a commodity
Chile	legal – not classified
Colombia	no statutory regulation
Costa Rica	legal – classified as a currency
Cuba	legal – classified as a currency
Ecuador	illegal
Mexico	restricted use – classified as a currency
Nicaragua	legal
Peru	no statutory regulation

Source: Coin Dance 2018: Global Bitcoin Political Support & Public Opinion, in: <https://coin.dance/poli> [5 Jan2018].

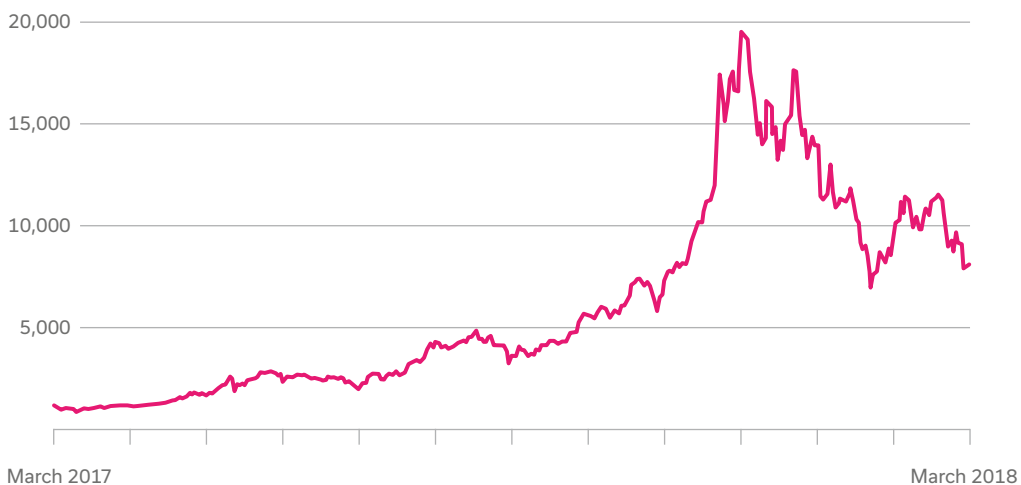
such as the US dollar or the euro. It has to be said that there have also been several Bitcoin crashes in the past, but its value has always soared again in the wake of those crashes. The accusation that it is a pyramid scheme, i.e. that investors are fraudulently incited to finance the earnings of other investors without being aware of this fact, is also not true. When it comes to Bitcoin, there is simply no central authority that could act fraudulently.

From the governance perspective, the picture for digital currencies is ambivalent.

There is a problem when it comes to tax, however. It is especially the financially weak states with a large informal sector, that are highly dependent on tax revenues. However, Bitcoin and other cryptocurrencies are difficult to monitor, which may result in revenues not being recorded. One of the best-known weaknesses, but also strengths, of digital currencies such as Bitcoin, is the anonymity of their users. In a

positive sense, this means that corrupt or fragile regimes can be circumvented. But this can also be used to trade in illicit goods such as weapons and, particularly in Latin America, drugs. Albeit in recent years, law enforcement agencies, especially in the USA, have managed to reduce this kind of illegal trade, at least with regard to Bitcoin. For example, there are now software programmes that can track Bitcoin movements – and hence illegal activities – with much greater accuracy. However, newer cryptocurrencies are able to fool these kinds of software programmes, leaving something of a grey area. On the other hand, the theft of digital currencies is also on the increase. Hackers regularly succeed in illegally obtaining digital currencies through complex online attacks. Their targets may be cryptocurrency exchanges such as the Japanese Coincheck – from which 429 million euros were stolen – or private internet accounts (wallets).⁹ Such thefts can cast a negative light on cryptocurrencies, but as with all technical innovations, consumers and developers will probably have to go through a learning curve when it comes to cryptocurrency security. The use of digital currencies is unlikely to decrease over the long term, however.

Fig. 1: Bitcoin Price Progression in US Dollars



Source: CoinMarketCap 2018: Cryptocurrency Market Capitalizations. Bitcoin (BTC), in: <https://coinmarketcap.com/currencies/bitcoin> [16 Mar 2018].

Overall, there is some ambivalence towards digital currencies such as Bitcoin from a governance perspective. Bitcoin and other digital currencies operating on the basis of blockchain technology, have the potential to reduce the influence of central banks. But this does not necessarily have to be a bad thing, as it could also serve to limit political influence on central banks and therefore also the risk of abuse. It could mean that central banks gain greater independence. Thus, the main challenge will probably be accepting a loss of fiscal sovereignty and not trying to prevent it. Digital currencies open up huge opportunities for people in fragile states and for those who hitherto had no access to financial markets. Against this backdrop, authoritarian regimes themselves must not succeed in abusing digital currencies in order to circumvent capital market controls. The result would be a discrediting of digital currencies and the associated potential for development policy.

Potential Governance Applications: Sustainability Certification

One of the main potential applications for blockchain technology is for supply chain disclosure. As mentioned at the start of this article, a blockchain captures every transaction and records it in a way that prevents it from being subsequently modified. Today, end consumers want to know that a product has complied with environmental and social standards from the beginning to the end of a production process. For this reason, many countries have issued the appropriate guidelines and regulations, which aim to ensure compliance with these standards. In Latin America in particular, there are many such regulations, but they are simply not being implemented. It is expensive for businesses to do this, as they have to document all production and processing steps centrally. If other companies are involved, they have to request the relevant reports from them. This process is not only expensive, but also prone to errors and fraud due to the use of local middlemen. There is often little that public supervisory authorities can do to counteract this problem. Moreover, emerging and developing

countries are particularly likely to view mandatory compliance with such standards as of minor political importance. External certification service providers are therefore often called upon to guarantee compliance with standards. A kind of self-certification industry has now evolved. However, this means that there is still something of a grey area between what is being reported and what is actually happening on the ground. In the end it has to be trusted.

BT can provide full and transparent supply chain disclosure without the use of intermediate entities. Initial attempts are currently underway to use a blockchain to make coffee production – still one of Latin America’s main exports – totally transparent. The start-up company Bext360, has developed machines the size of a photocopier that can be used by coffee bean producers in the country of origin to directly track the quality and price of beans.¹⁰ To do so, beans are poured into the machine, where they are photographed and evaluated using artificial intelligence or software algorithms. The producer is then immediately provided with information on the quality and price of the beans. A third entity (person or company) that may have provided this service in the past, is no longer required. The coffee beans can now be uniquely identified during every subsequent processing stage until they are enjoyed in the café or office. In addition to the information on country of origin, further information such as growing and working conditions can of course also be mapped with full transparency. Another start-up company, Provenance, has devoted itself to this particular issue and has developed the appropriate software for it.¹¹ But it is not only the coffee production middlemen that are likely to become superfluous; expensive certification systems will also need to reconsider their business model.

Combatting Climate Change

The significance of a transparent and forger-proof supply chain would be even greater if the Amazon rainforest’s ability to counter climate change, could somehow be captured in a



Deforested: Blockchain technology could also be used for the protection of the climatically indispensable Amazon rainforest. Source: © Paulo Whitaker, Reuters.

blockchain. Because of its size, the Amazon has a considerable influence on the global climate. Its rainforests act as a global lung that absorbs and stores the CO₂ that is so harmful to the climate. Preserving the Latin American forest is therefore the goal of many national and multi-lateral conservation programmes, which provide a good political framework for potential blockchain start-ups. The UN is trying to dissuade

forest owners from carrying out deforestation by providing financial compensation or alternative use models as part of its “Reducing Emissions from Deforestation and Forest Degradation in Developing Countries” (UN-REDD) programme and other initiatives.¹² The programme can be financed directly via funding or via the issuance of CO₂ certificates, which are then sold to the industry that requires the necessary proof.



Today, 16 Latin American states have signed up to UN-REDD. The programme is also included in almost all the national climate protection plans (NDCs) developed by Latin American countries. In the future, it is safe to assume that CO₂ certificates and CO₂ pricing based on an emissions trading scheme or taxes, will gain in significance. CO₂ markets, for example, are listed as a climate protection instrument in the

Paris climate agreement, which will be progressively implemented over the coming years. The member states of the Pacific Alliance – Peru, Colombia, Chile and Mexico – have agreed to adopt CO₂ pricing in the future and to cooperate on voluntary emissions trading. In addition, Canada, Colombia, Costa Rica, Chile, Mexico and the governors of California, Washington, Alberta, British Columbia, Nova Scotia, Ontario and Quebec have adopted a declaration for supranational cooperation on CO₂ pricing throughout America. Further initiatives such as the International Carbon Action Partnership (ICAP) and the Carbon Pricing Leadership Coalition, even intend to expand this approach on a world-wide scale.

Start-ups and established companies alike are already trying to profit from these political frameworks by capturing CO₂ certificates on blockchains and making them tradable. The start-up company CarbonX, for example, has adopted the approach of using certificates from the UN-REDD mechanism.¹³ Certificates are converted into a digital currency using blockchain technology and then given to companies, which in turn create an incentive for consumers to purchase environmentally-friendly or sustainable products. Consumers then receive a certain amount of the digital currency when they purchase local products with a low carbon footprint, and can use this currency to buy other products. This approach makes it possible to bring CO₂ certificates from the UN-REDD forest protection programme to the end consumer.

Other approaches such as the corporate cooperation between IBM and the Chinese Energy Blockchain Lab go one step further by converting emissions trading systems to systems based on blockchain technology.¹⁴ Emissions trading based on a blockchain would also have the potential to capture CO₂ certificates from all over the world and make them tradable without national borders. Latin America in particular, with its vast areas of forest, may well be able to benefit financially from such a system. For example, if a coal-fired power plant operator in Europe is obliged to produce CO₂ certificates because it

emits CO₂, it could use the decentralised blockchain network to locate the relevant providers, such as forest owners in Latin America. The certificate is visible and verifiable for all parties concerned. It is also conceivable that smart contracting models could be used to secure the trade. After that, automatic mechanisms such as the forfeiture of CO₂ certificates would be activated if, for example, part of the forest that is represented by a CO₂ certificate were felled. At the same time, the automatic mechanism would also include a recourse claim (payment settlement, e.g. in Bitcoin or other cryptocurrency) for the user of the emission certificate. Blockchain technology could ultimately help emissions trading to achieve a global breakthrough.

Clean Energy

In recent years, Latin America has become one of the world's most attractive locations for investments in renewable energies. The liberal economic course adopted by many countries such as Mexico, Chile, Colombia, Peru and Argentina has led to the gradual opening up and modernisation of what were previously highly restricted energy markets. Auctions are one of the key regulatory instruments for the expansion of renewable energies in Latin America. Due to intense competition, the costs associated with new wind and photovoltaic systems have consistently fallen throughout the region. Prices reached during the most recent auctions in Peru and Mexico in 2016, are similar to those for hydroelectric power, which currently dominates the electricity sector. Mexico and Chile have the lowest prices in the world.

BT could also be used for green electricity certification and trading of electricity within a neighbourhood.

The expansion of renewable energies in Latin America could be given a further boost by blockchain technology. It is assumed that it will have

an impact on almost all areas of the supply chain in the energy industry. The Federal Association of the German Energy and Water Industries (BDEW) sees six potential areas for improvement.¹⁵ It believes that

1. the charging infrastructure in the area of electromobility,
2. the certification of energy products,
3. neighbourhood models,
4. system services,
5. the electricity wholesale market and
6. asset management

could all benefit from the technology.¹⁶ The energy industry is thus facing further disruptions. The global expansion of renewable energies and the decline in the value of fossil fuels have already caused a major upheaval in the energy industry and rendered numerous business models obsolete.

The biggest changes in the Latin American energy industry could be brought about by the development of new neighbourhood models, as well as green electricity certification. Blockchain technology makes it possible to have direct trading of electricity within a neighbourhood. If, for example, someone has a photovoltaic module on the roof or a wind turbine in the garden, they can use it to sell the surplus electricity that is generated directly to the neighbourhood. Centralised electricity brokers would no longer be necessary. Decentralised power supplies could therefore be an attractive option in Latin America, where grid connection is still very poor in many rural areas. Green electricity certification, on the other hand, allows consumers to check the source of the electricity they consume. If it is important for the electricity consumers to know that their electricity actually comes from renewable energy sources, they can find out for certain via the blockchain. The start-up company SolarCoin has even issued its own digital currency for this purpose.¹⁷ This means that every owner of a solar system registered with SolarCoin receives a SolarCoin for every megawatt hour of electricity. This can then be used to trade. A SolarCoin is currently worth about five euro cents

(as at 8 February 2018).¹⁸ In Latin America, companies from Mexico, Brazil, Argentina, Chile, Peru and Colombia are all participating in the scheme. Imagine how many SolarCoins there would be if all renewable energy plants were to participate, and what an attractive additional source of income this would provide for investors and the owners of solar power plants. The green electricity certification model could also be used to promote regional added value in the area of renewable energy development. In this way, SolarCoins and the like could also be used to reward regional contributions in particular.

Land Ownership

Maintaining land title records in Latin America is not a straightforward task that can be achieved by simply using a land registry or cadastral office. Not only because precisely these offices are often susceptible to corruption, but also because the appropriate legislative framework as a whole is absent in many cases. There have also been a considerable number of redistributions of land ownership rights in many Latin American countries in recent decades due to a wide range of political and historical developments. The expansion of land use for agriculture, mining and forestry, along with the use of hydroelectric power and the search for oil reserves, has and continues to significantly change land ownership patterns in many Latin American countries. This process was and still is susceptible to high levels of corruption. The Peruvian lawyer and entrepreneur Rodolfo Orellana, for example, was arrested in 2015¹⁹ for falsifying documents with the help of a network of lawyers and notaries in order to obtain the title deeds to estates in Peru. The Peruvian authorities ended up entering him as the owner of the properties in the official property register. The stolen estates were then sold, earning him millions.

Here, blockchain technology could be used in a particular way to help prevent corruption. There is no reason why land ownership rights could not be transferred using a blockchain, on which transactions would be permanently recorded in a transparent manner and could not be

subsequently falsified. Honduras decided to go down this route in 2015. The plan is for a blockchain to be developed in cooperation with the US start-up Fatcom, that will list all ownership claims. However, it is unclear just how much progress the project has actually made so far.²⁰ In Brazil, another start-up, Ubitquity LLC, working in cooperation with the Brazilian *Cartório de Registro de Imóveis* (land registry), has started to develop a blockchain solution for the recording of land title records.²¹ The pilot project will initially take place in the Pelotas and Morro regions of southern Brazil. Commenting on the project, the CEO of Ubitquity LLC said: “The blockchain allows ownership and title disputes to be handled in a fair and transparent fashion, and serves as a backup in case the original is destroyed or misplaced”.²²

Land title records captured on a blockchain are secure and can be communicated in a transparent manner. In addition to curtailing illegal land sales and seizures, this can also save considerable expense. The typical third entity, the notary, would basically become superfluous to requirements.

Conclusion

BT can make a significant contribution to the future development of Latin America. It provides a robust alternative to weak state authorities in the fight for democratically legitimised laws and standards that have only been applied to a limited extent, or not at all. BT could therefore provide democratic structures with a new legitimacy, especially in developing and emerging countries. The decentralised currency Bitcoin, which functions as a kind of alternative currency to those issued by politically misused central banks, is already a perfect example of this. However, the technology itself can also be abused, as evidenced by the increasing use of digital currencies by authoritarian regimes to circumvent international capital market barriers. It is also difficult to curb the trade in illegal goods. The fact that a blockchain never forgets also presents a potential problem. If public administrations or social media services, for

example, opted to work on a blockchain basis, it would probably be very difficult to enforce a right to be forgotten. It is therefore vital for the future use of BT that free and democratic societies provide the greatest possible freedom in the ongoing development of the technology. This will require both political courage and trust. At the end of the day, this is the only way that it will be possible to counteract the misuse of BT by authoritarian regimes and to exploit the technology's potential opportunities in the long term.

In practice, there are already numerous areas of potential application for BT in Latin America that could provide positive benefits. Supply chain disclosure using BT can help local producers generate new income. Combatting climate change and protecting the rainforest could be improved by blockchain CO₂ trading and could also create new sources of income. The expansion of renewable energies could also receive an additional boost. Land ownership titles could be maintained in a transparent and permanent way. These are just a few examples of many that are currently being worked on by Latin American start-ups in particular. Not all of them will achieve a sustainable business base, but some of them will achieve a breakthrough and make a significant contribution to positive, long-term developments in the region.

-translated from German-

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